

APPENDIX C

RELATIVE RISK ASSESSMENT FOR A BENCHMARK UTILITY

1 **Introduction**

2 In risk premium models the relative risk coefficient adjusts the overall market risk premium up
3 or down depending on whether the individual security (company) is more or less risky than the
4 market as a whole. More risky stocks have a relative risk coefficient greater than 1.0 and less
5 risky stocks a relative risk coefficient less than 1.0. All risk premium models have this same risk
6 assessment relative to the market, whether they are the capital asset pricing model (CAPM)¹
7 where the only source of risk is the market risk, or models that introduce other sources of risk.
8 However, even within a two factor model, where the risk free rate is often regarded as risky due
9 to interest rate risk,² or the Fama-French three factor model³ where size and the market to book
10 ratio (in their model termed the book to market ratio) are additional sources of risk, the
11 coefficient on the market is still the main measure of risk. Estrada,⁴ for example, shows that for
12 the DOW 30 US stocks the simple CAPM expected return at 9.70% is only 0.20% more than that
13 estimated using the three factor Fama-French Model and that the market risk premium is much
14 larger than either the size or book to market premiums.

15 With the CAPM the relative risk assessment is the expected covariance between the security's
16 return and that on the market scaled by the variance of the return on the market. This is called the
17 security's beta coefficient (β) and measures the contribution of the security to the risk of a
18 diversified portfolio. We normally estimate actual historic beta estimates by a simple ordinary
19 least squares (OLS) regression of the security's return on that of the market. In any OLS
20 regression the intercept is called alpha and the slope coefficient is called beta, which is why these
21 terms are used pervasively in finance. However, estimating beta coefficients entails the exact

1 William Sharpe, "Capital asset prices: a theory of market equilibrium under conditions of risk," Journal of Finance 19, 1964.

2 Fisher Black, "capital market equilibrium with restricted borrowing", Journal of Business, July 1972 .

3 Eugene Fama and Ken French, "The cross section of expected stocks returns," Journal of Finance 59, 1992.

4 "The three factor model a practitioners guide," Journal of Applied Corporate Finance, Spring 2011.

1 same problem as estimating the market risk premium, since both use the actual or historic
2 returns. This is, the estimate is very sensitive to what happened during the estimation period. To
3 overcome this problem in estimating the market risk premium we go back over very long periods
4 of time. For estimating beta coefficients we can't do this to the same extent, since the risk of a
5 firm or industry changes much more than the overall risk of the market. Instead, we tend to use
6 estimates from similar firms and industries as well as more judgment in understanding the
7 economic and financial factors underlying the beta estimates. In this way we can get a better
8 understanding of the expected beta coefficient.

9 **Historic Beta Estimates for Canadian utilities**

10 Until 2002 we have data on the "old" Toronto Stock Exchange Indexes. However, in 2002 the
11 organisation of these indexes was taken over by Standard and Poors who harmonized them with
12 their global indexes. These changes roughly coincided with the loss of many traditional Canadian
13 utilities. It was also controversial in transferring Enbridge and TransCanada from pipelines,
14 where they were regarded as similar to utilities into energy services. However, the historic risk
15 metrics for the Canadian utility sector using the TSE sub-indexes were as indicated in Schedule
16 1.

17 The great advantage of the sub-index betas is that they include more companies than the
18 individual estimates and the data is more readily available.⁵ This is particularly important due to
19 the fact that a large number of regulated firms, like Consumers Gas, Maritime Electric, Terasen
20 Gas (FortisEnergyBC) etc., have disappeared through corporate reorganisation. Although this
21 means that their individual company betas have also disappeared, it does not mean that their
22 economic impact has disappeared. Consumers Gas now shows up as part of Enbridge, Terasen
23 Gas as Fortis etc., so their economic impact continues to show up in the sub index betas.
24 However, there are two disadvantages: the first is that the largest regulated utility in Canada
25 traditionally was Bell Canada and its parent BCE was classified as a utility. This was despite the
26 impact of BCE's non-regulated operations on the sub index betas. The second is that the sub

5 Index data is available at the end of the month, whereas company data is only available in May-June of the following year. The TSX sub index data ends in May 2002. The Telcos were removed from the utility sub index as part of this reorganisation.

1 indexes are weighted according to the TSE weights for each company. Consequently, these are
2 not simple averages but *market value weighted* averages, so that big companies like BCE have a
3 disproportionate weight.

4 It is important to remember that betas are simply a statistical estimate of the extent to which a
5 stock moves with the general market over a particular period of time. By convention, betas are
6 estimated over a five-year period. This means that if a critical event happens during the
7 estimation period, then the beta estimate will pick it up. However, once the event “passes out” of
8 the five-year estimation window, the impact of the event will disappear from the beta estimate.
9 For example, the graph in Schedule 1 shows that beta estimates were trending to a common
10 average until 1987, after which the pipeline beta increased and the others decreased. This lasted
11 for five years until they again came together.

12 If I had estimated betas during the period ending say in 1990, I would have estimated that gas
13 and electric betas had dropped and pipeline betas increased. However, is it reasonable to say that
14 gas and electric risk dropped during this period? The answer is no. What happened was that there
15 was a large stock market crash in October 1987 (-22.0%) and this was such a significant factor
16 that whatever happened in that one month affected all the beta estimates for the next five years
17 until October 1992, when the October 1987 results were no longer in the sample period.

18 Professional judgement would indicate that it is unreasonable to just use the statistical estimate
19 without recognising the underlying events that caused it, and then to make appropriate
20 adjustments. It is my judgement that betas tend to revert to their long run average levels: for the
21 market as a whole this is 1.0, but for regulated firms from Schedule 1, this is about 0.45-0.55.⁶
22 There is no indication from Schedule 1 that the non-Telco betas were reverting to 1.0.⁷
23 Consequently it is illogical to weight them with 1.0, as an “adjusted beta”, since there is no
24 expectation that their risk is increasing to that of an average firm. So what explains the dramatic
25 changes in betas at the end of the TSE data period in 2002 as indicated below?

6 This is also accepted in the literature. Gombola and Kahl, “Time series properties of utility Betas,”
Financial Management, 1990, come to the same conclusion.

7 The Telcos have been reclassified out of utilities, since they are no longer ROE regulated.

	Gas/Electricity	Telco	Pipes	Utility
DEC/96	0.52	0.60	0.54	0.60
DEC/97	0.47	0.61	0.44	0.59
DEC/98	0.53	0.80	0.42	0.83
DEC/99	0.37	0.96	0.18	0.96
DEC/00	0.21	0.82	0.06	0.80
DEC/01	0.17	0.87	-0.14	0.83
DEC/02	0.14	0.85	-0.18	0.80

1

2 The answer is Nortel and the Internet bubble. During the late 1990s, the technology and internet
3 boom were driving North American markets. Nortel was controlled by BCE, so that BCE's stock
4 price was being driven by Nortel and the internet boom. In fact, this was driving the entire
5 Canadian stock market as Nortel and JDS Uniphase became an increasing part of the market and
6 at one point made up almost 35% of the value of the TSE300. As the prices of Nortel and JDS
7 Uniphase increased, so did the Telco and Utility indices and the TSE300. When this boom turned
8 into a crash and Nortel declined from \$1,240 to under \$10,⁸ Nortel took the Canadian market and
9 the Telco and utility indices down with it. This is what caused the high beta estimates for the
10 Telco and utility indexes in both 2000 and 2001.

11 In contrast, the gas and electric and pipeline betas declined. The reason for this was that as the
12 market went on a technology driven boom and bust, these stocks were largely ignored. In the
13 case of the Pipeline sub index, the collapsing share price of TransCanada Pipelines during 1999
14 and its recovery during 2000 was against a strong equity market in 1999 and a weak one in 2000.
15 This movement of TransCanada's share price against the general market movement induced a
16 negative correlation and the low beta estimate for the pipeline sub index.⁹ The message is simply
17 that "betas" do not come out of thin air: they reflect what happens in both the market as a whole
18 as well as an individual stock or industry.

19 After 2002 the TSX introduced new indexes and back dated the data to 1987. For the new utility
20 index the sub index beta estimates are in Schedule 2. This graph is slightly different from that in

8 Nortel has now filed for bankruptcy protection, the prices are adjusted for a 1:10 reverse split.

9 This stock market reaction was due to the poor performance of TransCanada's non-regulated operations in 1999 and the programme of retrenching and selling them off in 2000.

1 Schedule 1 in that it includes the beta coefficient estimated both with (beta1) and without (beta2)
2 the impact of interest rate changes, as well as the sensitivity of the utility sub index to changes in
3 interest rates which I call “gamma.” We can make several comments looking at Schedule 2 in
4 isolation and comparing it with Schedule 1.

5 First is that the beta estimates for the utilities are essentially the same whether we include or
6 ignore the impact of interest rate risk. Second we can clearly see the same effect as in Schedule
7 1; that betas were pulled down as Nortel and the tech boom affected the Canadian market.
8 However, we can now see that by 2008 the internet bubble tech effect had passed out of the five
9 year estimation window and betas were reverting to their normal level of 0.50. However, the
10 stock market crash starting September 2008 clearly has delayed this movement back to normal as
11 betas started to drift down again, although nowhere near as dramatically as in the Internet crash.
12 Finally, utilities are clearly interest sensitive stocks as the consistent positive gamma coefficients
13 indicate. It is also clear that this sensitivity exhibits a negative correlation (-0.43) with the beta
14 estimates, that is, beta coefficients tend to fall as gamma coefficients increase. This is because
15 interest rates tend to increase during good times as the stock market booms and then fall in
16 recessions. This interest rate sensitivity reduces the exposure of utility investors to the market
17 during recessions when interest rates tend to fall as the Bank of Canada conducts a more
18 expansionary monetary policy.

19 This statistical result echoes the comment of RBC utility analyst Maureen Howe who
20 commented that Canadian utilities are¹⁰

21 “like convertible bonds. When interest rates are low, as they currently are, the companies
22 trade on their bond value and are supported by tax-efficient dividend yields. When the 10-
23 year GOC yield rises above 6%-6.5%, the Canadian companies trade on the basis of their
24 underlying earnings and P/E.”

25 Maureen Howe’s observation is confirmed by the relative performance of the PE multiples for
26 the TSX versus the Utilities as indicated in the following graph provided in answer to an
27 information request in a current hearing before the BC Utilities Commission (BCUC IR#1. 19.0).

28

10 October, 3 2001 RBC Morning Comment.

Canadian Utilities Group Historical P/E Ratios
January 2002 – April 2012



1

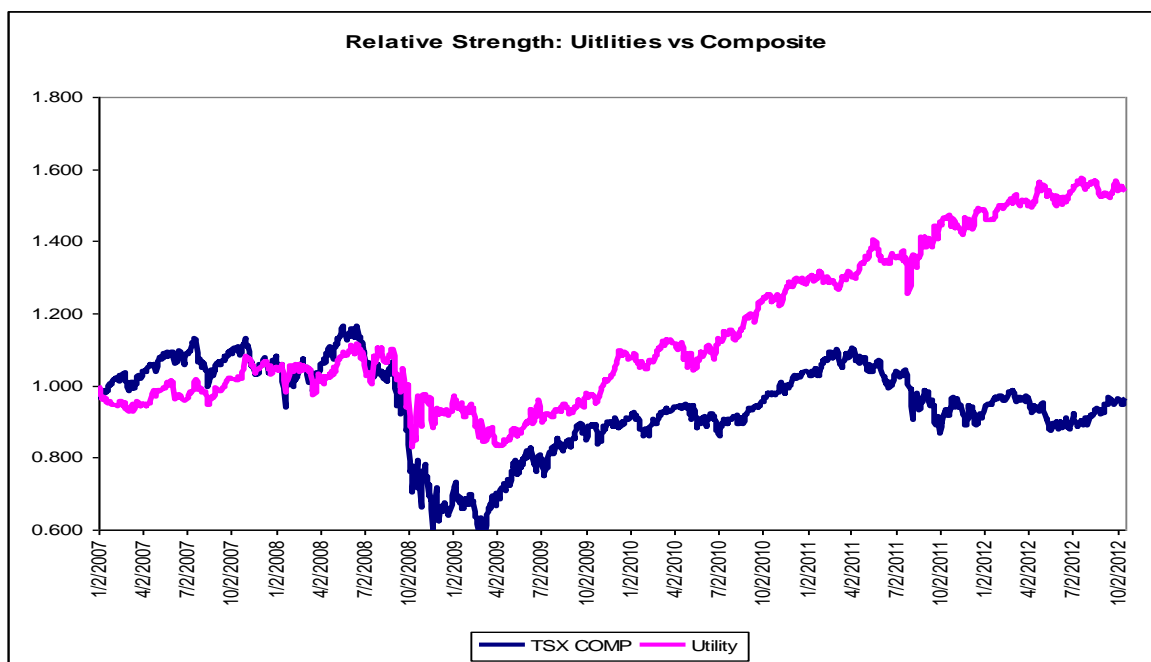
2 The graph indicates that whereas the PE multiple of the TSX is weaker than in 2009 the very low
3 interest rates have supported the valuations of the dividend rich utilities so that their PE ratios
4 have increased relative to the market as a whole. This observation is consistent with Maureen
5 Howe’s observation that with low interest rates utilities trade on their “bond or fixed income
6 value.in line with the observation that their cost of equity capital has declined.

7 We can see the same effects in the individual beta estimates where the average utility beta is
8 graphed in Schedule 3.This average is both with and without TransAlta, since it is not strictly a
9 rate of return regulated utility anymore. Again we see the Nortel internet bubble effect and the
10 trend of the betas back toward their normal level being interrupted by the stock market crash of
11 2008/9. The individual beta estimates are provided in Schedule 4. Note as indicated above, I
12 place little weight on individual beta estimates as they reflect what did or did not happen during
13 the estimation period rather than being a forward risk coefficient.

14 **Further evidence of relative risk**

15 The estimation of betas is a statistical exercise but all it involves is the intuition that if a stock is
16 risky, when the market goes up it goes up more than the market and, conversely, when the
17 market goes down it goes down more than the market. On the other hand a low risk stock does
18 not move very much with the market. As a result, and like a bond, it lowers the overall volatility

1 of the portfolio. In the extreme a totally risk free asset would be uncorrelated with the market so
2 by definition has no “market” risk.¹¹ Following this intuition the following graph has the relative
3 price performance of the major utilities against the TSX Composite from the start of the crisis to
4 the latest available prices. The chart ignores dividends but since utilities pay higher dividends
5 than the average on the TSX adding them would simply enhance the performance of the utilities.



6
7 What the graph illustrates is that an investor in utilities in January 2007 would have sailed
8 through the stock market crash and would currently be up about 50%, whereas a passive TSX
9 Composite portfolio would still be down a few percentages. Of course the better performance of
10 the utility sector versus the TSX does not indicate that they are more risky since cash
11 outperformed the TSX as well. Instead it simply indicates the low risk nature of an investment in
12 Canadian utility stocks.

13 In Schedules 5-7 I chart the price performance of the Canadian utilities against the TSX
14 Composite index specifically over the period of the financial crisis. For example, Schedule 5 has
15 the charts for Emera and Fortis. They clearly show the dramatic impact of the period from

¹¹ The R squared of a regression of its stock return against the market would by definition be 0. The R squared of a “beta” regression is largely a meaningless statistic since the explained variance by definition is the R squared times the variance of the market return.

1 September 2008 until Summer 2009 when the TSX first dropped over 50% from its high and
2 then recovered 60% of that 50% drop. In contrast Fortis only dropped 20% and Emera less than
3 that. It is this performance that lowers their recent beta estimates, since they demonstrated in the
4 worst stock market crash for decades just how low risk Canadian utilities are. Further as extreme
5 events they have a disproportionate effect on any estimates that come from minimizing the
6 squared error, such as ordinary least squares beta estimates.

7 In Schedule 6 are the same graphs for Valener (former Gaz Metro) and Canadian Utilities. Gaz
8 Metro dropped by just over 20% and CU about the same. Finally in Schedule 7 are the same
9 graphs for Enbridge and for Pacific Northern Gas which I have traditionally regarded as the
10 riskiest Canadian utility. For PNG we can clearly see that it behaved much more like the market
11 as a whole during the crash and recovery since it lost almost 50% of its value like the market.
12 Further we can see the more dramatic recovery and its recent 50% increase in price indicating
13 how unique factors significantly affect the beta estimates. In this case AltaGas announced on
14 October 31, 2011 that it was acquiring PNG for \$36.75 so the share price immediately jumped.
15 The acquisition closed on December 20, 2011 and the shares are now delisted.

16 For Enbridge we also see that it sailed through the stock market crash and recovery with scarcely
17 any losses. This was acknowledged at the time. On December 9, 2008 a story in the Calgary
18 Herald¹² discussed the implications of the price of oil dropping from \$144 US to \$50 and what it
19 meant for oil and gas companies and pipelines. Hal Kvisle, CEO of TransCanada, noted that
20 although it was more difficult to raise money TransCanada had just raised \$1.16 billion in an
21 issue that was over subscribed. Kvisle indicated that it underscored the attractiveness of
22 infrastructure investments in troubled times. The article also noted that Enbridge had increased
23 its dividend by 12 per cent and upped its 2009 earnings guidance by about 20 per cent.
24 Enbridge's CEO Pat Daniel said he's confident "the company can maintain 10 per cent earnings
25 per share growth for at least the next five years, a testament to the *low-risk business model*
26 (emphasis added) of pipelines in general." The article went on to state that "Enbridge has been
27 one of the top performers on the TSX, losing only 1.7 per cent year-over-year compared to more

12 Shaun Polczer, "Pipeline companies weather darkest hour; Executives say crisis worst in oil patch history" Calgary Herald, December 9, 2008.

1 than 41 per cent for the TSX main board and a whopping 56 per cent for the TSX's capped
2 energy index since June.” It further quoted Daniel as saying "I think that speaks to the low risk,
3 steady predictable nature of our business,*People don't really realize it until you get into*
4 *tough times like this.*" (emphasis added) The article went on to note that “Enbridge shares
5 gained \$1.32, or three per cent, on the Toronto Stock Exchange on Monday to finish at \$39.50
6 while Trans-Canada added 60 cents to close at \$33.90.”

7 Although Pat Daniels stated that people don’t realise how low risk Enbridge’s business is, this is
8 not true as the stock market clearly noticed this. In my judgment, almost all the utilities
9 demonstrated the low risk nature of their business throughout the recent financial crisis. This is
10 not to say that they have no risk, the fact that their betas are positive indicates they do have
11 market risk, as like all securities their prices move with the market. However, I am sure that
12 many investors would have preferred to hold a diversified portfolio of utility stocks as of
13 September 1, 2008, rather than the TSX composite.

14 **US utility stocks as a comparison**

15 I have started looking at the relative risk of a sample of seven low risk US utilities. The US
16 utilities represent the intersection of two samples used previously by Ms. McShane and Dr.
17 Vilbert both of whom have testified before Canadian boards on behalf of utilities.. As a result, I
18 regard this intersection of their “sets” as what might be regarded as smaller and purer US
19 utilities, rather than the bigger more diversified holding companies that are in the S&P500 index.
20 Schedule 8 provides a graph of their average beta estimates. These are estimated in the same way
21 as the Canadian betas from monthly holding period returns over a five year time period updated
22 monthly.

23 The estimates from this sample of specially chosen low risk US utilities are very similar to the
24 population of Canadian utility holding companies. This demonstrates that it is possible to search
25 the entire population of US utilities and create a small sample of low risk US utilities similar to
26 the overall population in Canada. Of course it does not show that the typical US utility is
27 equivalent in risk to the typical Canadian utility. In Schedule 9 are the recent beta estimates for
28 the individual US utility holding companies and with this caveat we can see that their average

1 beta at the end of 2011 was 0.34 or almost the same as that for the Canadian utility holding
2 companies. The betas of these low risk US utilities were increasing to average 0.64 immediately
3 prior to the financial crisis and then as in Canada, their stability during the financial crisis caused
4 their betas to drop.

5 I have traditionally judged utility risk to be in a range 0.45-0.55 based on the long run tendency
6 for utility betas to revert to the grand utility mean. However, this mean-reversion process shows
7 little sign of happening since we have now had two major stock market crashes in the last ten
8 years that have reinforced their low risk status. It is my judgment that the relative risk of
9 Canadian utilities is no more than 0.50. This is supported by the evidence from a sample of
10 Canadian UHCs, the Canadian utility sub index, the price performance of these utilities during
11 the financial crisis and the betas of these low risk US utilities. It is very difficult to see how 0.50
12 is a low end of a reasonable range for beta estimates since there is no statistical evidence from
13 the last 20-30 years that I am aware of that would place these estimates at a significantly higher
14 level.

15 **Adjusted betas**

16 Utility witnesses frequently adjust utility betas not toward their grand mean of 0.50 or so, but the
17 overall market mean of 1.0. Such a process is justified by the seminal work of Marshall Blume¹³
18 who showed that if there is measurement error when we estimate a very low beta the chances are
19 the true beta is underestimated and vice versa. For the whole universe of stocks he recommended
20 that we adjust betas by taking 2/3 of the estimated beta and adding 0.33, which essentially means
21 weighting them 1/3 with the market mean of 1.0 and 2/3 with the actual beta. This procedure
22 means that low betas are increased and high betas are reduced. However, low estimates for
23 utilities do not mean they are under-estimated, since utility betas are perennially low, which is
24 what the long history of betas estimated back to 1956 demonstrates. Instead as Gombola and
25 Kahl demonstrated utility betas are better mechanically adjusted by weighting with their grand
26 mean. However, I prefer to use judgment.

13 Marshall Blume, Betas and their regression tendencies, Journal of Finance June 1975.

1 Canadian utilities are generally not inter-listed in the US and mainly trade on the TSX so as far
 2 as I am aware their reported betas are usually the actual estimates. On October 26, 2012, I
 3 captured the data in Schedule 10, which includes basic quote data for 8 traded Canadian utility
 4 holding companies from the Royal Bank of Canada Direct Investing web site. In particular the
 5 following captures their beta estimates as reported by RBC

		BETAS					
	Ticker	RBC	Booth	GOOGLI	PRICE	MKT CAI	
	ENBRIDGE	ENB	0.24	0.32	0.14	39.14	31.3
	TRANSCANADA	TRP	0.33	0.36	0.25	44.25	31.2
	CANADIAN UTILITIES	CU	-0.01	0.03	0	65.85	8.47
	TRANSALTA	TA	0.62	0.76	0.38	15.22	3.61
	EMERA	EMA	0.21	0.21	0.22	34.87	4.33
	FORTIS	FTS	0.14	0.14	0.07	33.29	6.34
	VALENER	VNR	0.37	0.36	0.22	16.14	0.6
	VERESEN	VSN	0.39	0.36	0.28	12.94	2.6
	AVERAGE BETA		0.29	0.32	0.20		12.26
6	MEDIAN BETA		0.285	0.34	0.22		5.34

7 The average beta estimate by the Royal Bank of Canada was 0.29 or slightly lower than my
 8 estimate (Booth) of 0.32 derived using data up until December 2011. The median beta estimate is
 9 also slightly lower at 0.29. There are no significant differences in the betas estimated by RBC
 10 and my own, except perhaps for TransAlta, where RBC's is lower. However, the key insight is
 11 that the RBC betas like mine have not been "Blume adjusted" by weighting the actual estimates
 12 with one. Quite the contrary, they seem to be the actual or what utility witnesses refer to as the
 13 "raw" beta estimates.

14 In addition I also captured the Google Finance betas.¹⁴ What is interesting is that their betas are
 15 almost uniformly lower than either mine or RBCs with average and median betas of 0.20 and
 16 0.22 respectively. Google clearly uses a different data provider¹⁵ but the important insight is that
 17 their beta estimates are not Blume adjusted either.

14 Yahoo does not report betas for the Canadian companies.
 15 Yahoo's data comes from Compustat (Capital IQ)

1 RBC also reported the following relative risk assessments (betas) in their November equity
 2 strategy report which was focused on Canadian financial institutions, which is why they are
 3 boxed in the table.

TSX Sector Betas				
	1 Year	3 Years	5 Years	Average
Energy	1.30	1.25	1.27	1.27
Materials	1.19	1.08	1.26	1.18
Industrials	0.87	0.90	0.87	0.88
Cons Disc	0.70	0.62	0.56	0.63
Consumer Staples	0.48	0.32	0.35	0.38
Health Care	1.05	0.53	0.50	0.70
Financials	0.82	1.04	0.92	0.93
Banks	0.81	1.00	0.91	0.90
Diversified Financials	0.57	0.82	0.77	0.72
Insurance	1.01	1.27	1.04	1.11
Real Estate	0.68	0.84	0.76	0.76
Info Tech	1.02	0.88	0.92	0.94
Telecom	0.39	0.40	0.47	0.42
Utilities	0.55	0.40	0.46	0.47

Priced as of Nov 17, 2011

Source: RBC Capital Markets Research, Bloomberg

4
 5 The utility betas estimated by RBC are for the sub index and are broadly consistent with my own
 6 estimates. The utility betas average 0.47 and range from 0.55 using one year to 0.40 using three
 7 years of data which would go back and capture their demonstrated low risk characteristics during
 8 the financial crisis.

9 Similarly the following table gives the betas for the six surviving US¹⁶ utilities in Schedule 9. In
 10 this case I have also added the betas as reported by Yahoo and Google Finance. Again the
 11 average beta is 0.29 according to RBC and 0.34 for my estimates. There are no serious
 12 differences in the beta estimates and again there is no indication that RBC has adjusted their beta
 13 estimates in any way. In contrast, for some companies the Yahoo Finance betas are higher.
 14 However they are not consistent with the Blume adjustment either and likely reflect different

16 Nicor was acquired by WGL in December 2011

1 time horizons. In contrast, the Google betas are all marginally lower than those of either myself
 2 or RBC, again indicating there is no indication of any beta adjustment methodology.

		BETAS					
		BOOTH	RBC	YAHOO	GOOGLIPRICE	MKT	Cap
AGL	GAS	0.44	0.43	0.43	0.41	40.32	4.74
NEW JERSEY RESOURCES	NJR	0.26	0.22	0.45	0.22	44.47	1.85
NORTHWEST	NWN	0.32	0.25	0.42	0.26	47.71	1.28
PIEDMONT	PNY	0.32	0.28	0.53	0.29	31.48	2.27
VECTREN	VVC	0.4	0.36	0.39	0.34	29.20	2.4
WGL	WGL	0.29	0.22	0.44	0.22	39.46	2.04
AVERAGE		0.34	0.29	0.44	0.29	38.77	2.43
MEDIAN		0.32	0.27	0.44	0.28	39.89	2.16

3
 4 In comparing the Canadian versus the US samples of utilities the US firms are quite small with
 5 average market capitalisation (total equity market value) of US\$2.43 billion versus the average
 6 for the Canadian companies of \$12.26 billion. Even after we adjust for the outliers and look at
 7 the medians, it still much higher for the Canadian sample at \$5.34 billion versus US\$2.16 billion
 8 in the US. Why this is important is that one of the constant criticisms levelled against the CAPM
 9 is that beta adjusted, small firms earn higher rates of return than large firms, which some
 10 attribute to risk, so we might expect a higher risk level for these US firms than for the Canadian
 11 sample.

12 However, more importantly the way RBC and I estimate betas is consistent with conventional
 13 practise. One of the biggest data providers in Canada is the Financial Post where their Corporate
 14 Analyzer data base includes ten year financial data for larger publicly listed Canadian
 15 companies. Their definition of beta is as follows:

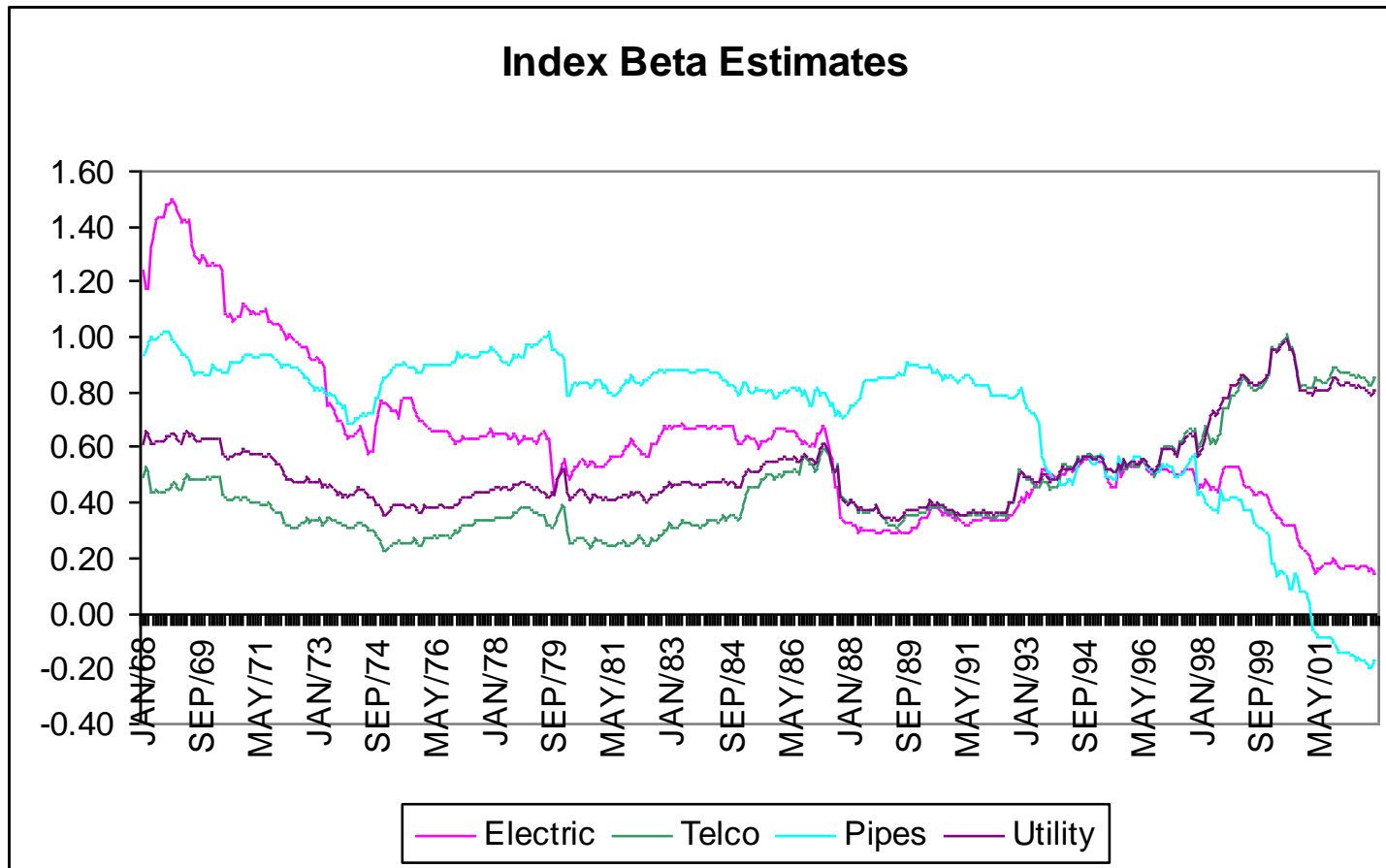
Beta (Corporate Profiles)

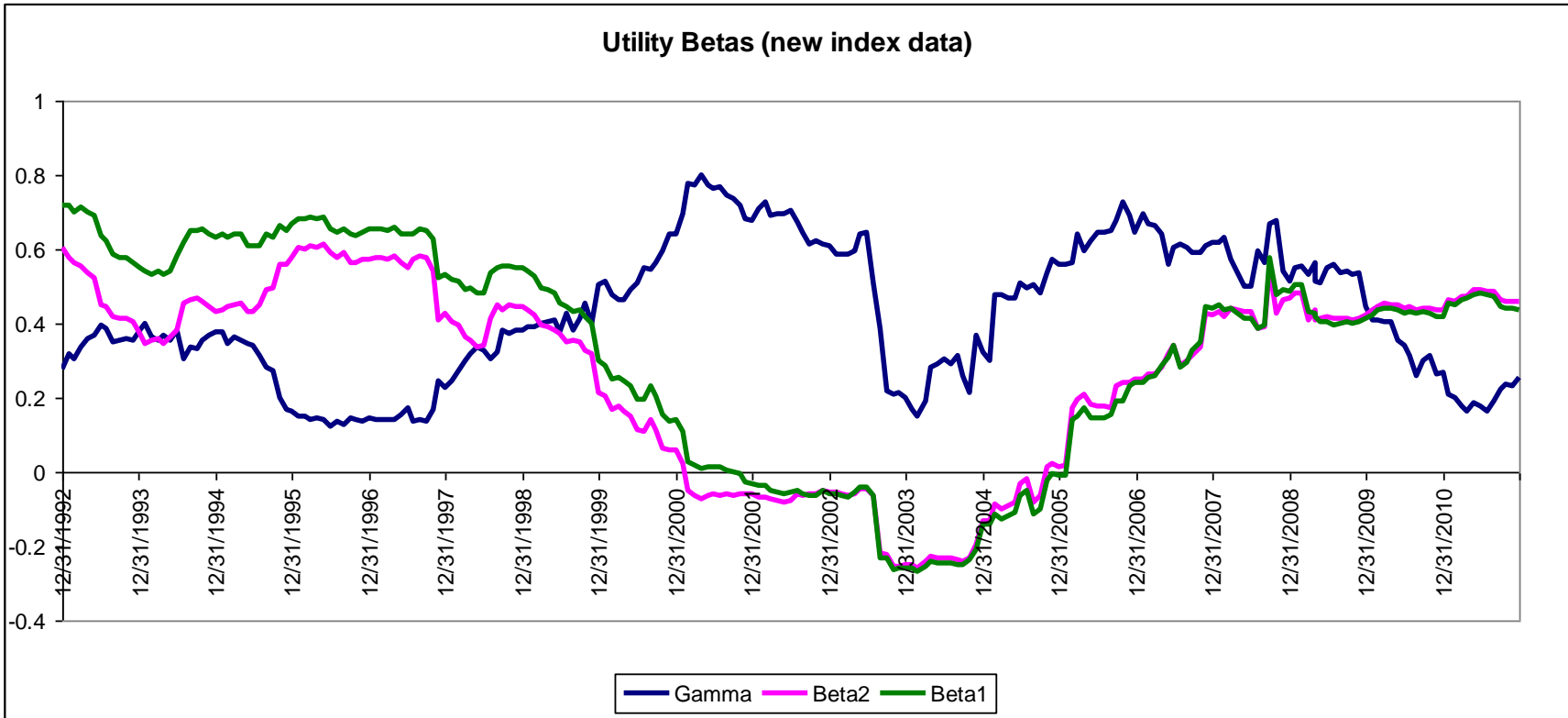
Beta factors are derived from a historical regression of percentage share price changes for the selected company on percentage changes in the TSE 300 price index. The unadjusted slope coefficient from this regression is the beta factor. Beta factors may be computed on a variety of weekly or monthly data. Betas shown in FP Analyzer are for 52 weeks, 36 months, 60 months and 120 months.

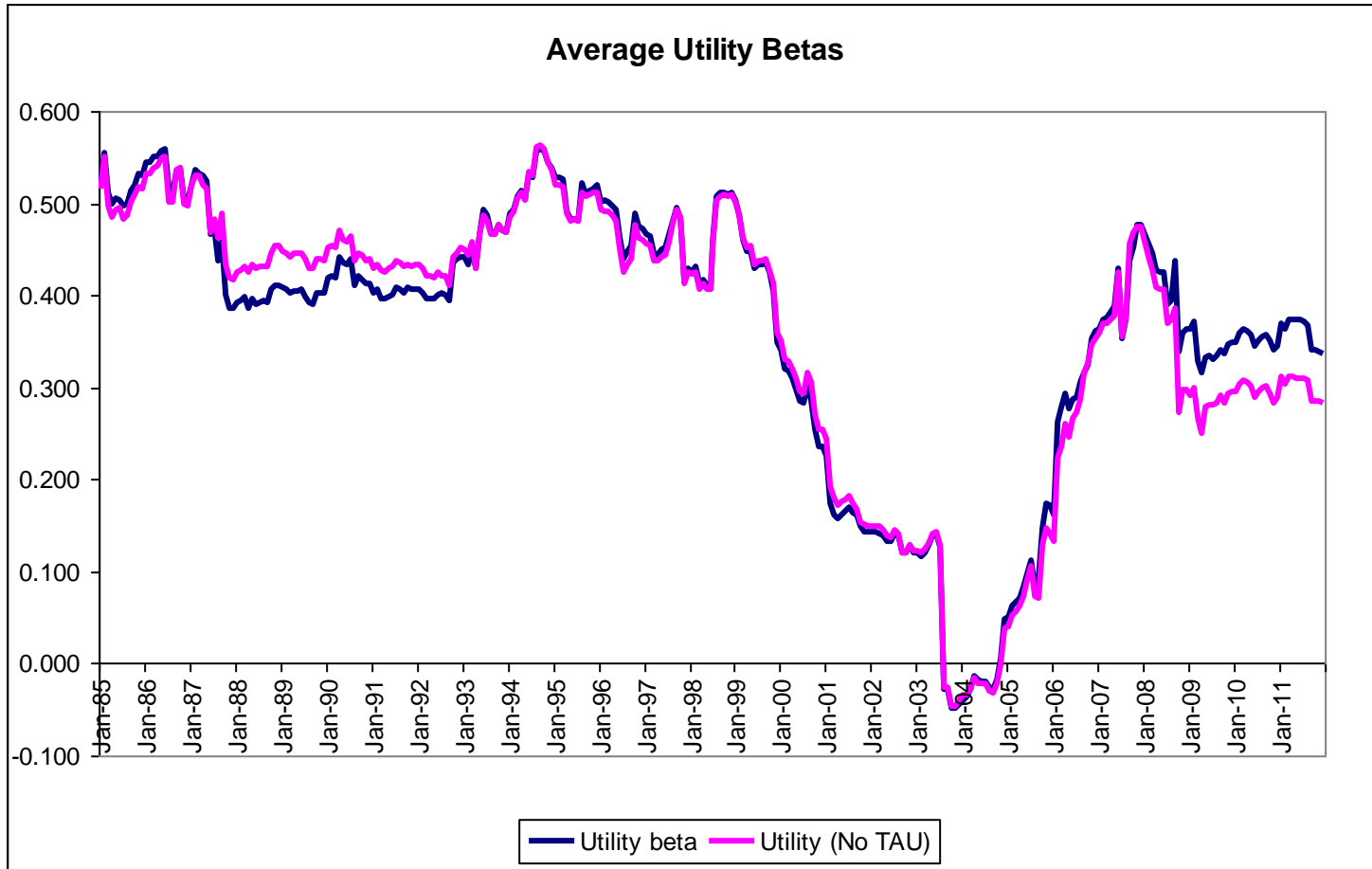
16
 17 Again there is no discussion of “adjusting” betas using the Blume procedure.

1 However, even if we Blume adjust my beta estimates the “adjusted beta” is only 0.55
2 $(0.33+0.66*0.32)$, while if we adjust to the utility mean of about 0.55 they are about 0.40
3 $(.33*.55+.66*.32)$. I do not believe in these mechanical adjustments, but they support a
4 reasonable range going forward for the relative risk of a benchmark Canadian utility to be 0.45-
5 0.55.

6





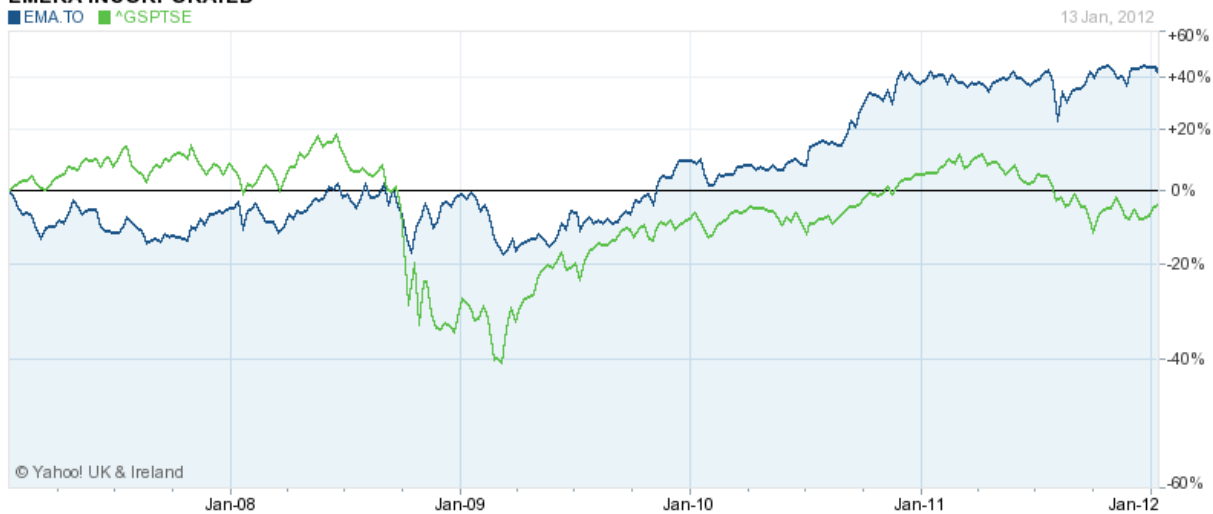


SCHEDULE 4

	CUL	EMERA	Enbridge	Fortis	GMI	PNG	Terasen	TRP	Ft Chicago	TransAlta	Utility beta
1985	0.60			0.66	0.29	0.55	0.21	0.79		0.62	0.53
1986	0.61			0.52		0.38	0.14	0.85		0.53	0.50
1987	0.32			0.25		0.46	0.47	0.59		0.22	0.39
1988	0.36			0.30		0.45	0.52	0.63		0.20	0.41
1989	0.36			0.25		0.42	0.56	0.60		0.22	0.40
1990	0.37			0.21		0.47	0.56	0.59		0.27	0.41
1991	0.38			0.25		0.46	0.54	0.54		0.28	0.41
1992	0.50			0.38		0.35	0.47	0.55		0.40	0.44
1993	0.58		0.39	0.37		0.56	0.47	0.45		0.47	0.47
1994	0.61	0.54	0.54	0.45		0.45	0.60	0.58		0.56	0.54
1995	0.49	0.54	0.48	0.51	0.47	0.45	0.63	0.53		0.58	0.52
1996	0.49	0.51	0.50	0.38	0.48	0.29	0.57	0.48		0.57	0.47
1997	0.61	0.40	0.44	0.31	0.38	0.44	0.48	0.34		0.46	0.43
1998	0.57	0.56	0.47	0.49	0.37	0.59	0.46	0.56		0.53	0.51
1999	0.54	0.43	0.25	0.34	0.20	0.52	0.33	0.25		0.27	0.35
2000	0.38	0.29	0.07	0.24	0.18	0.49	0.23	0.18	0.24	0.07	0.24
2001	0.28	0.22	-0.10	0.16	0.11	0.45	0.16	-0.05	0.14	0.08	0.14
2002	0.24	0.17	-0.18	0.15	0.08	0.47	0.10	-0.07	0.12	0.10	0.12
2003	0.14	-0.05	-0.40	-0.04	0.01	0.36	0.01	-0.42	-0.04	-0.06	-0.05
2004	0.13	-0.01	-0.31	0.03	0.15	0.46		-0.21	0.05	0.14	0.05
2005	0.23	0.06	-0.18	0.22	0.19	0.48		-0.18	0.17	0.41	0.15
2006	0.34	0.08	0.21	0.48	0.43	0.51		0.29	0.36	0.41	0.34
2007	0.45	0.21	0.53	0.62	0.78	0.24		0.47	0.34	0.48	0.46
2008	0.06	0.11	0.30	0.17	0.46	0.20		0.34	0.42	0.86	0.32
2009	0.08	0.16	0.32	0.20	0.38	0.43		0.39	0.45	0.78	0.35
2010	0.06	0.22	0.34	0.16	0.36	0.40		0.39	0.39	0.80	0.35
2011	0.03	0.21	0.32	0.14	0.36	0.48		0.36	0.36	0.76	0.34

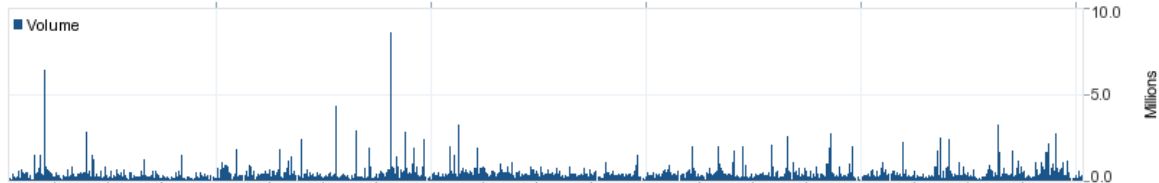
EMERA INCORPORATED

EMA.TO ^GSPTSE

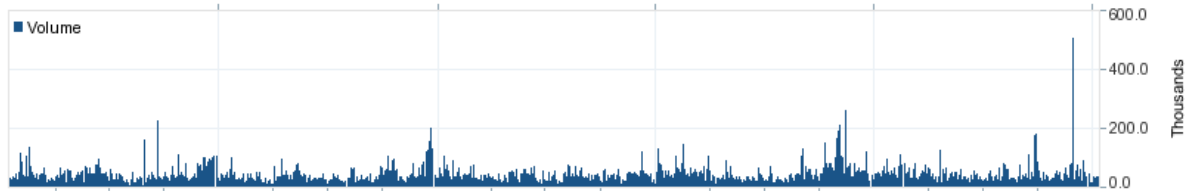
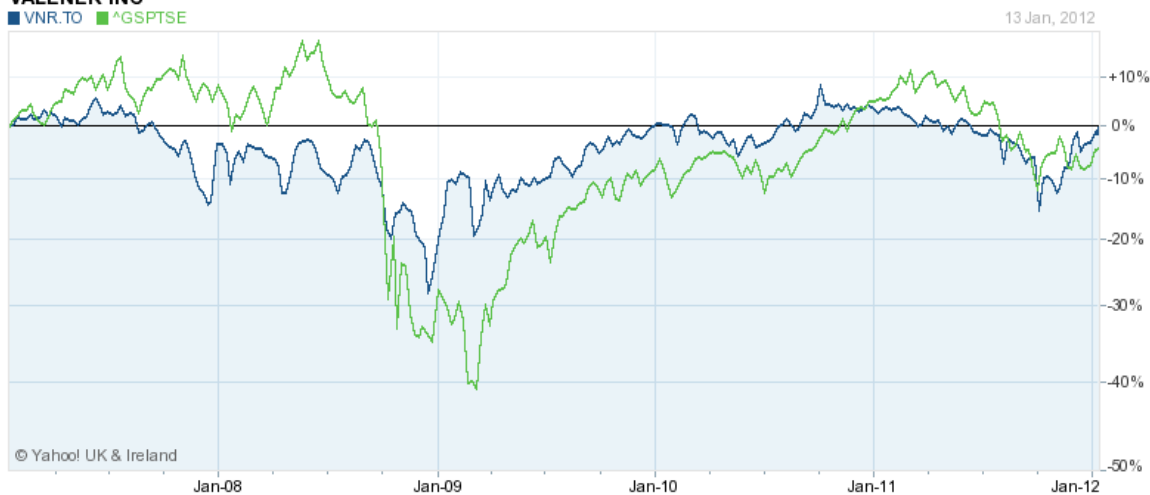


FORTIS INC

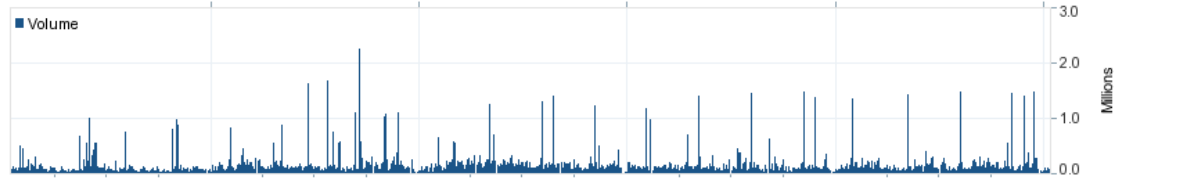
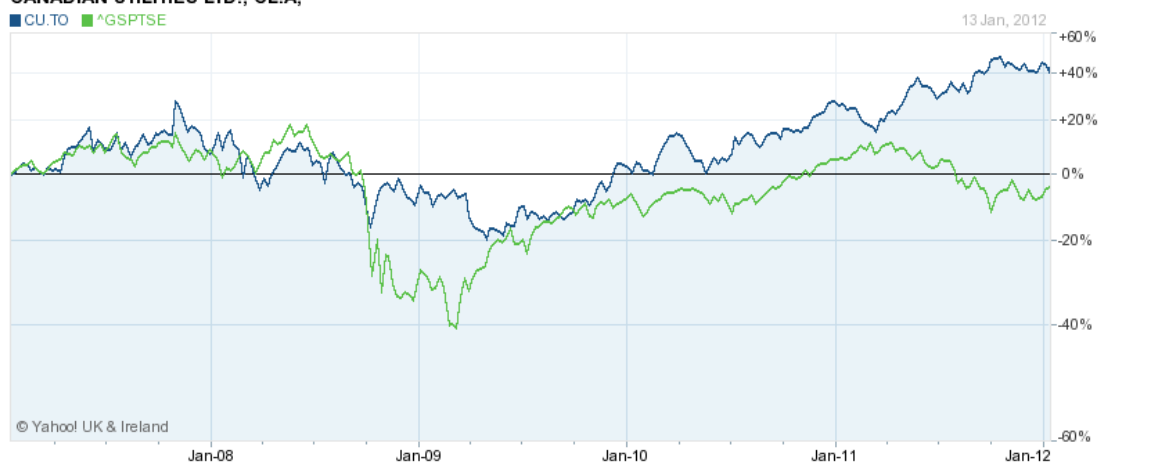
FTS.TO ^GSPTSE



VALENER INC
 ■ VNR.TO ■ ^GSPTSE



CANADIAN UTILITIES LTD., CL.A,
 ■ CU.TO ■ ^GSPTSE

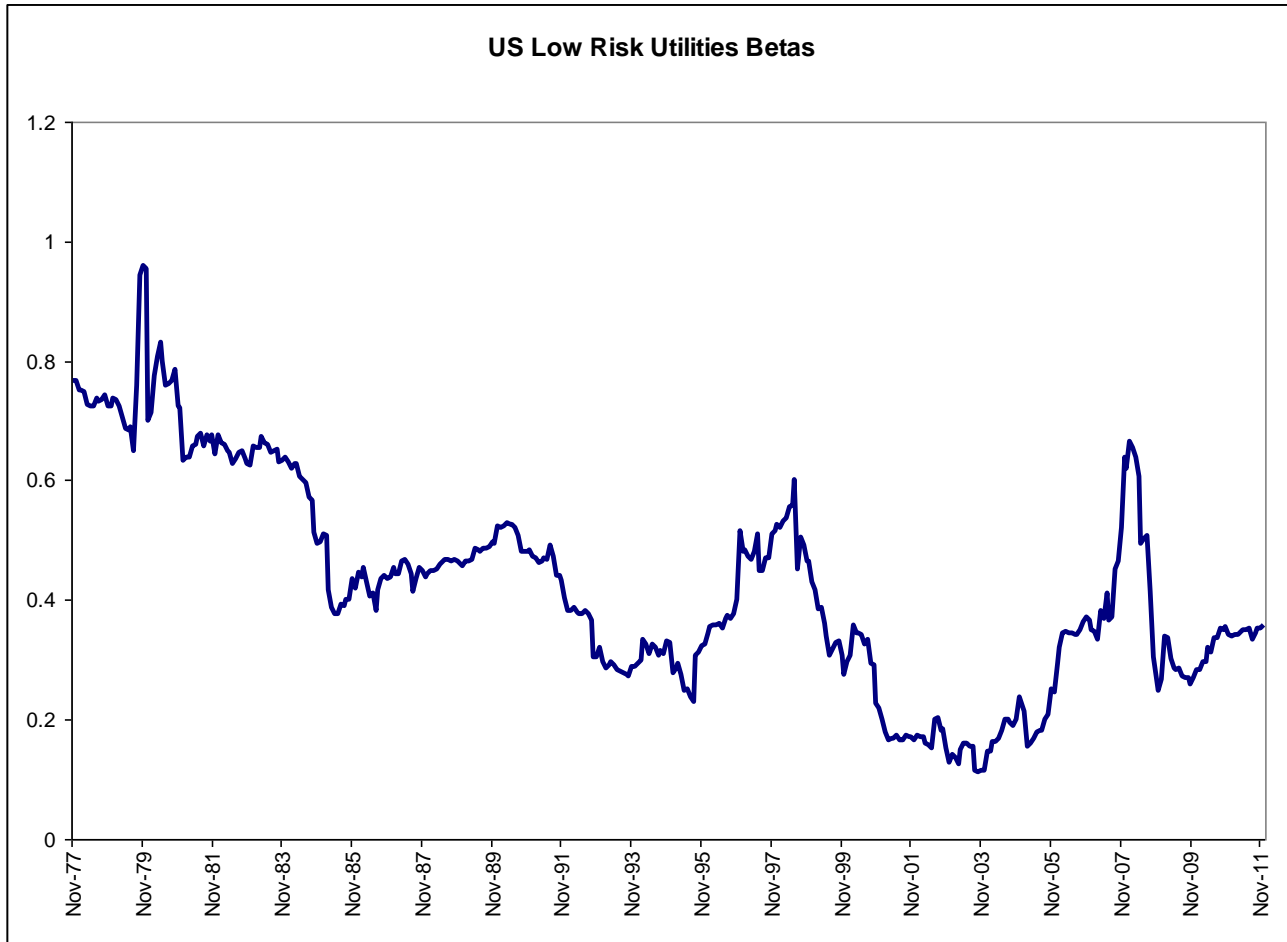


ENBRIDGE INC
 ■ ENB.TO ■ ^GSPTSE



PACIFIC NORTHERN GAS LTD
 ■ PNG.TO ■ ^GSPTSE





	AGL	IJ Resource	Northwest	Piedmont	Vectren	WGL	Nicor	Average
12/31/1998	0.59	0.46	0.47	0.50	0.34	0.48	0.41	0.46
12/31/1999	0.42	0.33	0.19	0.30	0.14	0.29	0.26	0.27
12/31/2000	0.26	0.24	0.07	0.16	0.17	0.20	0.18	0.18
12/31/2001	0.26	0.24	0.07	0.16	0.17	0.20	0.05	0.17
12/31/2002	0.23	0.09	-0.10	0.10	0.21	0.15	0.22	0.13
12/31/2003	0.20	0.03	-0.18	-0.04	0.33	0.13	0.32	0.12
12/31/2004	0.30	0.11	0.01	0.12	0.46	0.22	0.45	0.24
12/30/2005	0.38	-0.05	0.06	0.25	0.34	0.22	0.52	0.25
12/29/2006	0.38	0.02	0.14	0.33	0.51	0.27	0.90	0.37
12/31/2007	0.50	0.51	0.75	0.58	0.56	0.70	0.87	0.64
12/31/2008	0.32	0.15	0.35	0.05	0.26	0.23	0.39	0.25
12/31/2009	0.40	0.13	0.25	0.20	0.37	0.17	0.39	0.27
12/31/2010	0.44	0.22	0.31	0.25	0.41	0.25	0.52	0.34
12/30/2011	0.44	0.26	0.32	0.32	0.40	0.29	0.48	0.36

VERESEN INC (VSN:TSX, CA)
12.92 CAD ↓ **0.08 (-0.62%)** Volume: Above Average
 As of 26 Oct 2012 at 2:23 PM EDT.

QUOTE DETAILS

Open	12.94	P/E Ratio (TTM)	56.2x
Last Bid/Size	12.91 / 4	EPS (TTM)	0.23
Last Ask/Size	12.92 / 4	Next Earnings	24 Oct 2012
Previous Close	13.00	Beta	0.39
Volume	204,356	Monthly Dividend	0.0833
Average Volume	240,629	Dividend Yield	7.74%
Day High	12.99	Ex-Dividend Date	29 Oct 2012
Day Low	12.88	Shares Outstanding	196.6M
52 Week High	15.83	# of Floating Shares	196.4481M
52 Week Low	11.67	Short Interest as % of Float	--

VALENER INC (VNR:TSX, CA)
15.96 CAD ↓ **0.13 (-0.81%)** Volume: Average
 As of 26 Oct 2012 at 2:23 PM EDT.

QUOTE DETAILS

Open	16.14	P/E Ratio (TTM)	22.0x
Last Bid/Size	15.96 / 25	EPS (TTM)	0.73
Last Ask/Size	15.99 / 2	Next Earnings	29 Nov 2012
Previous Close	16.09	Beta	0.37
Volume	15,860	Quarterly Dividend	0.2500
Average Volume	22,188	Dividend Yield	6.27%
Day High	16.14	Ex-Dividend Date	26 Sep 2012
Day Low	15.95	Shares Outstanding	37.5M
52 Week High	16.60	# of Floating Shares	33.99757M
52 Week Low	14.41	Short Interest as % of Float	--

TRANSALTA CORP (TA:TSX, CA)
15.68 CAD ↑ **0.46 (3.02%)** Volume: Above Average
 As of 26 Oct 2012 at 2:22 PM EDT.

QUOTE DETAILS

Open	15.22	P/E Ratio (TTM)	--
Last Bid/Size	15.68 / 2	EPS (TTM)	-2.78
Last Ask/Size	15.69 / 29	Next Earnings	--
Previous Close	15.22	Beta	0.62
Volume	672,629	Quarterly Dividend	0.2900
Average Volume	475,493	Dividend Yield	7.40%
Day High	15.71	Ex-Dividend Date	29 Aug 2012
Day Low	15.17	Shares Outstanding	251.1M
52 Week High	22.86	# of Floating Shares	250.9098M
52 Week Low	13.96	Short Interest as % of Float	--

TRANSCANADA CORP (TRP:TSX, CA)
44.41 CAD ↑ **0.31 (0.70%)** Volume: Below Average
 As of 26 Oct 2012 at 2:21 PM EDT.

QUOTE DETAILS

Open	44.25	P/E Ratio (TTM)	22.5x
Last Bid/Size	44.41 / 9	EPS (TTM)	1.96
Last Ask/Size	44.42 / 14	Next Earnings	--
Previous Close	44.10	Beta	0.33
Volume	464,942	Quarterly Dividend	0.4400
Average Volume	1,237,124	Dividend Yield	3.96%
Day High	44.62	Ex-Dividend Date	26 Sep 2012
Day Low	44.14	Shares Outstanding	704.9M
52 Week High	46.29	# of Floating Shares	704.6334M
52 Week Low	39.25	Short Interest as % of Float	--

ENBRIDGE INC (ENB:TSX, CA)
39.31 CAD ↑ **0.28 (0.72%)** Volume: Below Average
 As of 26 Oct 2012 at 2:21 PM EDT.

QUOTE DETAILS

Open	39.14	P/E Ratio (TTM)	48.7x
Last Bid/Size	39.31 / 3	EPS (TTM)	0.80
Last Ask/Size	39.32 / 19	Next Earnings	--
Previous Close	39.03	Beta	0.24
Volume	602,028	Quarterly Dividend	0.2825
Average Volume	1,017,546	Dividend Yield	2.87%
Day High	39.50	Ex-Dividend Date	13 Aug 2012
Day Low	39.10	Shares Outstanding	797.6M
52 Week High	42.23	# of Floating Shares	795.201M
52 Week Low	34.07	Short Interest as % of Float	--

FORTIS INC (FTS:TSX, CA)
33.39 CAD ↓ **0.01 (-0.03%)** Volume: Below Average
 As of 26 Oct 2012 at 2:21 PM EDT.

QUOTE DETAILS

Open	33.29	P/E Ratio (TTM)	18.9x
Last Bid/Size	33.38 / 6	EPS (TTM)	1.77
Last Ask/Size	33.39 / 2	Next Earnings	--
Previous Close	33.40	Beta	0.14
Volume	102,956	Quarterly Dividend	0.3000
Average Volume	283,303	Dividend Yield	3.59%
Day High	33.51	Ex-Dividend Date	14 Nov 2012
Day Low	33.29	Shares Outstanding	190.0M
52 Week High	34.98	# of Floating Shares	189.2359M
52 Week Low	31.32	Short Interest as % of Float	--

EMERA INC (EMA:TSX, CA)**34.91 CAD** ↓ **0.03 (-0.09%)** Volume: Below Average

As of 26 Oct 2012 at 2:19 PM EDT.

QUOTE DETAILS

Open	34.87	P/E Ratio (TTM)	19.8x
Last Bid/Size	34.90 / 2	EPS (TTM)	1.76
Last Ask/Size	34.93 / 2	Next Earnings	9 Nov 2012
Previous Close	34.94	Beta	0.21
Volume	46,705	Quarterly Dividend	0.3500
Average Volume	142,781	Dividend Yield	4.01%
Day High	35.10	Ex-Dividend Date	30 Oct 2012
Day Low	34.86	Shares Outstanding	123.9M
52 Week High	35.72	# of Floating Shares	123.8934M
52 Week Low	31.02	Short Interest as % of Float	--

CANADIAN UTILITIES LTD (CU:TSX, CA)**66.38 CAD** ↑ **0.56 (0.85%)** Volume: Below Average

As of 26 Oct 2012 at 2:14 PM EDT.

QUOTE DETAILS

Open	65.85	P/E Ratio (TTM)	16.6x
Last Bid/Size	66.31 / 3	EPS (TTM)	3.96
Last Ask/Size	66.40 / 3	Next Earnings	1 Nov 2012
Previous Close	65.82	Beta	-0.01
Volume	25,025	Quarterly Dividend	0.4425
Average Volume	89,074	Dividend Yield	2.67%
Day High	66.38	Ex-Dividend Date	7 Nov 2012
Day Low	65.85	Shares Outstanding	87.3M
52 Week High	72.00	# of Floating Shares	59.68449M
52 Week Low	59.00	Short Interest as % of Float	--

AGL RESOURCES INC (GAS:NYSE, US)**40.32 USD** ↓ **0.12 (-0.30%)** Volume: Below Average

As of 26 Oct 2012 at 2:26 PM EDT.

QUOTE DETAILS

Open	40.87	P/E Ratio (TTM)	23.3x
Last Bid/Size	40.32 / 2	EPS (TTM)	1.74
Last Ask/Size	40.33 / 1	Next Earnings	1 Nov 2012
Previous Close	40.44	Beta	0.43
Volume	118,402	Quarterly Dividend	0.4600
Average Volume	318,764	Dividend Yield	4.56%
Day High	40.87	Ex-Dividend Date	15 Aug 2012
Day Low	40.20	Shares Outstanding	117.5M
52 Week High	43.69	# of Floating Shares	116.9872M
52 Week Low	36.59	Short Interest as % of Float	1.17%

VECTREN CORP (VVC:NYSE, US)**29.20 USD** ↑ **0.20 (0.69%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	29.08	P/E Ratio (TTM)	15.0x
Last Bid/Size	29.19 / 1	EPS (TTM)	1.94
Last Ask/Size	29.20 / 4	Next Earnings	5 Nov 2012
Previous Close	29.00	Beta	0.36
Volume	132,541	Quarterly Dividend	0.3500
Average Volume	309,553	Dividend Yield	4.79%
Day High	29.24	Ex-Dividend Date	13 Aug 2012
Day Low	29.00	Shares Outstanding	82.1M
52 Week High	30.75	# of Floating Shares	81.51709M
52 Week Low	27.01	Short Interest as % of Float	0.83%

NORTHWEST NATURAL GAS CO (NWN:NYSE, US)**47.71 USD** ↓ **0.18 (-0.38%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	47.99	P/E Ratio (TTM)	20.4x
Last Bid/Size	47.69 / 1	EPS (TTM)	2.34
Last Ask/Size	47.73 / 2	Next Earnings	2 Nov 2012
Previous Close	47.89	Beta	0.25
Volume	42,212	Quarterly Dividend	0.4550
Average Volume	113,836	Dividend Yield	3.81%
Day High	47.99	Ex-Dividend Date	29 Oct 2012
Day Low	47.53	Shares Outstanding	26.8M
52 Week High	50.80	# of Floating Shares	26.62257M
52 Week Low	43.90	Short Interest as % of Float	4.82%

WGL HOLDINGS INC (WGL:NYSE, US)**39.46 USD** ↑ **0.09 (0.23%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	39.46	P/E Ratio (TTM)	20.0x
Last Bid/Size	39.44 / 4	EPS (TTM)	1.97
Last Ask/Size	39.46 / 4	Next Earnings	12 Nov 2012
Previous Close	39.37	Beta	0.22
Volume	80,550	Quarterly Dividend	0.4000
Average Volume	189,027	Dividend Yield	4.05%
Day High	39.60	Ex-Dividend Date	5 Oct 2012
Day Low	39.34	Shares Outstanding	51.5M
52 Week High	44.99	# of Floating Shares	51.21511M
52 Week Low	37.65	Short Interest as % of Float	4.59%

PIEDMONT NATURAL GAS COMPANY INC (PNY:NYSE)**31.48 USD** ↓ **0.16 (-0.51%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	31.70	P/E Ratio (TTM)	20.4x
Last Bid/Size	31.48 / 1	EPS (TTM)	1.55
Last Ask/Size	31.49 / 2	Next Earnings	--
Previous Close	31.64	Beta	0.28
Volume	59,629	Quarterly Dividend	0.3000
Average Volume	317,517	Dividend Yield	3.81%
Day High	31.79	Ex-Dividend Date	20 Sep 2012
Day Low	31.38	Shares Outstanding	72.1M
52 Week High	34.74	# of Floating Shares	71.15555M
52 Week Low	28.90	Short Interest as % of Float	4.31%

NEW JERSEY RESOURCES CORP (NJR:NYSE, US)**44.47 USD** ↓ **0.32 (-0.71%)** Volume: Below Average

As of 26 Oct 2012 at 2:24 PM EDT.

QUOTE DETAILS

Open	44.91	P/E Ratio (TTM)	19.9x
Last Bid/Size	44.47 / 4	EPS (TTM)	2.25
Last Ask/Size	44.50 / 4	Next Earnings	--
Previous Close	44.79	Beta	0.22
Volume	35,438	Quarterly Dividend	0.4000
Average Volume	213,043	Dividend Yield	3.60%
Day High	44.91	Ex-Dividend Date	20 Sep 2012
Day Low	44.31	Shares Outstanding	41.6M
52 Week High	50.48	# of Floating Shares	41.30981M
52 Week Low	41.11	Short Interest as % of Float	4.06%